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IMPACT OF INFORMATION TECHNOLOGY GOVERNANCE MECHANISMS ON PUBLIC SECTOR FINANCIAL PERFORMANCE IN BAUCHI STATE, NIGERIA

Nana Mohammed[1*], Muhammad Auwal Kabir[1], and Abdulkadir Abubakar[1]
[1]Department of Accounting, Bauchi State University, Gadau, Bauchi, Nigeria

***Corresponding Address:** nanafaty99@gmail.com

Abstract

The aim of this paper is to examine the impact of IT governance mechanisms (ITG structures, ITG process, ITG relational mechanisms) on public sector financial performance in Bauchi state. The paper adopts cross-sectional survey research design and collected primary data using structured questionnaire. The population was 2316 staffs of the five selected MDAs within Bauchi state where the sample of 331 staff were selected using Krejcie and Morgan table. The data collected was analyzed using multiple regression technique with the help of SPSS version 23. The paper found that IT governance structures and processes have significant positive effect on public sector financial performance in Bauchi state. In line with the findings, the paper concludes that IT governance and its mechanisms serve as an effective tool for managing the state financial resources address the problem of inefficient service delivery inherent to public sector operations in Bauchi state. In view of the finding and conclusion outlined, it was recommended that Bauchi state public entities should implement a robust system of monitoring and evaluation of IT governance structures by regularly assessing the key performance indicators related to cost reduction, revenue enhancement and operational efficiency. They should also revisit their strategic objectives and financial goals to clarify how IT governance processes can fit in to contribute in achieving these objectives. Finally, government should contribute by enacting, implementing and enforcing enabling law that guides how IT resources of public entities should be governed in such a way that revenue accrued to the government is improved.

Keywords: *IT governance, ITG structures, ITG process, ITG relational mechanism and public sector financial performance.*

INTRODUCTION

The global rapid technological advancement dictates sudden changes and adjustments in organizations at all levels that requires new strategies to govern Information Technology (IT) and organizations. Thus, IT become vital factor in improving an entity's operational capabilities, which prompted organizations to understand the importance of investing in IT and integrating their IT resources with other managerial and organizational aspects (Menshawy et al., 2022). Earlier, the role of IT was merely to automate business processes, while today it is perceived as the main driver for the value creation of every organization. With this development, IT governance has become an important factor for the success of both public and private entities (Vejsely et al., 2020). As such, without effective governance of IT resources, investment in it would adversely affect the entity's operational efficiency and performance.

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Consequently, implementing IT governance effectively requires a set of instruments to encourage congruence with an entity's mission, strategies, values, norms, and culture which in turn leads to desirable IT behaviors and governance outcomes (Qahatan et al., 2020). The IT governance mechanisms include the structures, process and relational mechanisms. The IT governance structure focuses on the strategic value of IT and ensures that high-level controls are in place to achieve and sustain IT benefits (Campbell et al., 2020). This mechanism improve the performance by involving the personnel in the organization to make IT decisions, which involves investment decision on IT and other related investments as well as their responsibilities (Menshawy et al., 2022). Secondly, IT governance processes ensures that entity's objectives are optimally achieved by evaluating stakeholder needs, condition, option and set the direction through prioritization and monitoring the performance against agreed sets of goals (Castellanos, 2021). Thirdly, the relational mechanisms, which focus on ensuring that organization provides active participation of and collaborative relationships among the board, IT management, and line managers (Tonelli et al., 2017).

Public sector organizations are crucial for socioeconomic development of a country and the prosperity of its people. Therefore, an improved and sustained public service delivery is indispensable for these organizations (Ali et al., 2021). As a result, several organizations in public service rely on information technology for their daily operations as a key driver for the economic growth, which increased the investment level in IT system (Ndagire et al., 2020). Using technology in public organizations improve effectiveness and efficiency in public service delivery, which provide automation process in accessing public services using government IT platforms (Akonai & Singh, 2019). In Nigeria, public entities have recently begun to adopt IT in public activities and government transactions as a panacea for the backwardness and decay that are often seen in the sector (Obikaonu, 2020). Notwithstanding, this adoption has led the entities to acquire numerous IT resources into their activities, which requires the executive and IT managements' collaboration to include it into the organizational processes with a view to the attainment of the intended objectives (Obikaonu, 2020).

However, the potential of IT governance for public sector innovation and performance has not been fully grasped in public sector organizations of developing countries (Ali et al., 2021). This is because, many IT systems do not perform as expected either by failing at the inception stage or by failing to meet desired objectives, which lead to discontinuity of services, user frustration, loss of IT investment, increased redundancy, duplication of efforts, poor decision-making, and reputation loss (Dias et al., 2021). Furthermore, despite the pervasive use of IT in all operational spheres, many entities still fail to demonstrate concrete and measurable value from IT, which makes managers and IT executives to develop concerns about the alignment of IT with organizational needs and the impact of IT on productivity and costs reduction (Harguem, 2021). This implies that governance of IT resource is paramount in achieving better financial performance through cost reduction among other financial benefits, which requires empirical consideration. In view of that, this paper examined the impact of IT governance on public sector financial performance in Nigeria.

Furthermore, this study will benefit Bauchi state government to realize the benefit of aligning IT investment strategies to the organizational objectives as it is paramount to their financial objectives. Moreover, in view of the incessant failure of IT resources among public sectors entities in Bauchi state and beyond, findings and recommendations of this study would highlight ways for government to strengthen their financial management and IT resource controls in order to generate more revenue to the state through effective governance of IT. Theoretically, this study contributes by using financial performance as dependent variable in public sector. This is

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considered paramount because most studies in public sector do not consider financial performance since the organizations are not profit-making entities. However, despite the fact they are not for profit, financial performance in Nigerian public sector is relevant to their overall performance in service delivery and revenue generation as well.

Moreover, several attempts were made in the body of literature to address the issue of IT governance in relation to organizational performance and effectiveness. For instance, the studies conducted by Menshawy et al. (2022); Castellanos, (2021); Zhen et al. (2021) were conducted in this area but were limited to private organizations. Relatively few studies were conducted in public organization such as Ali et al. (2021) and Wiedenholf et al. (2018), which shows the scanty of literatures to consider the influence of IT governance on performance in public institutions particularly in Nigeria. In view of that, this paper is motivated to investigate the influence of ITG governance on financial performance of public institution in Nigeria with reference to Bauchi state public entities.

RESEARCH QUESTION

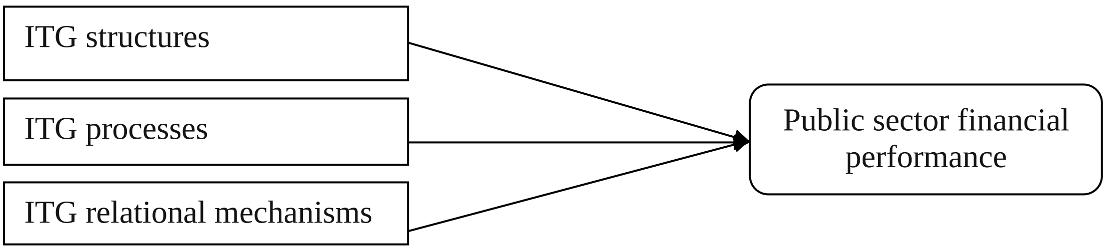
i. Does IT governance structures have significant effect on public sector financial performance in Bauchi state?
ii. Does IT governance process have significant effect on public sector financial performance in Bauchi state?
iii. Does IT governance relational mechanism have significant effect on public sector financial performance in Bauchi state?

LITERATURE REVIEW

Conceptual Framework and Review

Conceptual framework helps in explaining the relationship that the study tries to establish. It has been defined as the diagrammatical representation that shows the relationship between the variables (dependent and independent variable) of a study. In this study, the independent variables are IT governance structures, processes and relational mechanisms while the dependent variable is public sector financial performance.

Independent variables **Dependent variable**



Source: Castellanos (2021).

Concept of IT Governance

Information Technology Governance (ITG) is the form of responsibility of the top management and integral departments of organizational governance that covers decision rights and accountability framework influencing behavior using IT properly, and ensures effective, efficient IT goals (Akonai & Singh, 2019). In public sector, IT governance reflects responsibility of the board of commissioners, directors, managers, and IT management when formulating organizational structures of operational management, strategy and processes of IT

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management to achieve organizational goals, and ensures the implementation (Amali & Katili, 2018). Similarly, it is seen as the financial and administrative capacity to implement public policies that aim to make the state stronger, by overcoming the fiscal crisis, delimiting its area of activity. Thereby distinguishing between the strategic core and decentralized units, establishing a political elite able to make the necessary IT decisions and allocating a motivated and skilled bureaucracy (Wiedenhoft, et al., 2018). In the same vein, Campbell et al. (2020) viewed the concept as the structure of relationships, processes and mechanisms used to develop, direct and control IT strategy and resource allocation so as to achieve the goals and objectives of an entity. According to Shokouhyar et al. (2020), the construct emerged as a response to the growing pressure on all organizations to ensure that they are achieving value for money from their IT investment, which includes ensuring that investment is aligned with organizational strategic priorities.

Concept of Public Sector Financial Performance

Financial performance of public institution is the ability for the department heads to acquire and utilize the scarce resources allocated to them, in pursuit of its operational goals and the mandate (Kamau, 2019). Accordingly, public organizations' financial performance is measured in terms of asset turnover, returns on investments made, return on capital employed and net profits margins (Veerankutty et al., 2018). According to Hada et al. (2017), financial performance in public organization is based on criteria that often do not consider profitability, turnover, and financial return to shareholders. In large part, the performance of the public sector is reflected in issues such as transparency in costs, delivering benefits to citizens from public services, and quality of life (Ali et al., 2021). Moreover, Tonelli et al. (2017) further measured public sector financial performance is in terms of the ability to apply resources to fulfill institutional missions and to deliver benefits to citizens. The concept is used to measure firm's overall financial health over a given period and can also be used to compare similar ministries or agencies across the state or country to compare the ministries in aggregation (Ngazi & Ali, 2019).

Concept of IT Governance Mechanisms

IT governance mechanisms encompass arrangements that enable organization and IT executives to formulate policies and procedures, implement them in specific applications, and monitor outcomes (Lunardi et al., 2014). It is a framework of interaction among three key components: the first is known as ITG structures, followed by ITG processes and finally the IT governance relational mechanisms (Castellanos, 2021). These mechanisms are described conceptually in the subsequent segments:

IT Governance Mechanism

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IT Governance Structures

ITG structures refer to the way organization is structured in relation to the authority of IT decision-making (Qahatan et al., 2020). ITG structure is the governance mechanisms that focus on the strategic value of IT and ensures that high-level controls are in place to achieve and sustain benefits (Campbell et al., 2020). Similarly, ITG structures involve the personnel in the

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organization to make IT decisions, the organizational structure regarding IT investment, the participants of organizational IT decisions as well as their responsibilities (Menshawy et al., 2022). According, ITG structures are mechanisms that are derived from units, functions, roles, and responsibilities for proper IT decision-making (Castalennos, 2021).

IT Governance Process

ITG processes refer to the design of procedures for implementing management following IT strategies and policies (Levstek et al., 2022). Similarly, ITG processes is viewed by Campbell et al. (2020) as the governance mechanisms aimed at balancing the risk and return aspects of IT investment so as to consistently add value to the organization. In the view of Setiawan (2019), ITG processes is to ensure that entity's objectives are optimally achieved by evaluating stakeholder needs, condition, option and set the direction through prioritization and monitoring the performance against agreed sets of goals. Furthermore, ITG process is concerned about formalization and institutionalization of strategic IT decision-making or IT monitoring procedures (Castellanos, 2021). Further, ITG processes involve the organization's approach to monitoring results of IT assessment and setting directions, rules, and recommendations related to IT (Tonelli et al., 2017).

IT Governance Relational Mechanism

ITG relational mechanism refers to the active participation of, and collaborative relationships among, corporate executives, IT management, and the operational management (Castellanos, 2021). According to Qahatan et al. (2020) ITG relational mechanisms refers to the vital communication concerning IT from and to the senior executives where the participation can take place from the managerial capacity of chief information officer and consistent link with the senior executives and the communication between the parties. Therefore, the link between structures and process mechanisms refers to the relational mechanisms. Furthermore, ITG relational mechanisms are considered as the devices that look for opportunities to guarantee the effectiveness of ITG implementation (Menshawy et al., 2022).

Empirical Review

Numerous studies were conducted in the area of IT governance mechanisms in relation to performance of different entities in different contexts. Notable among them include Menshawy et al. (2022), which investigate the impact of ITG mechanisms on firm performance of Iraqi medium-sized enterprises with IT capabilities as a mediator using a survey of 223 board members and analysis using Structural Equation Model (SEM). The SEM results show that ITG structure and relational mechanisms have a significant positive relationship with firm performance, while ITG process revealed an insignificant relationship. In the same vein, Castellanos (2021) examined the impact of ITG mechanisms on business-IT alignment in Columbia using SEM and confirmatory factor analysis based on the data collected from 672 web-based surveys of selected companies. The result of the study found that ITG structures, process and relational mechanism have a significant positive association with business-IT alignment at 1% level of significance. Similarly, Ali et al. (2021) investigated the impact of IT governance on organizational performance through a mediation of innovation in Pakistani public sector organization based on the data from the 97 top-level cadre personnel using questionnaire, which was analyzed using PLS-SEM. The results revealed that ITG structures, process and relational mechanisms significantly and positively affected innovation and organizational performance. Innovation positively affected organizational performance and partially mediated the relationship between ITG and organizational performance.

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Also, Levstek et al. (2022) evaluate the role of ITG on SMEs performance based on a case study approach using semi-structured interviews with five members of strategic management in the medium-sized insurance companies. The outcome of the qualitative study affirms the existence of the relationship between the ITG structures, processes and relational mechanisms and the performance of SMEs. However, since these results are based on a single case study, they cannot be generalized. Therefore, a cross-sectional study could provide insight regarding cultural differences in adoption decisions and exploitation practices. Contrarily, Zhen et al. (2021) investigated the impact of ITG mechanisms on organizational agility and the role of top management support based on questionnaire from 326 firms in China and analysis with PLS-SEM. The finding of the study revealed that ITG process and relations positively and significantly influence IT exploration and exploitation, whereas they positively influence organizational agility. In contrast, the ITG mechanisms have insignificant relation with both IT exploration and exploitation. In another study, Fattah et al. (2019) investigated the influence ITG mechanisms on IT performance in Indonesian higher education based on questionnaire responses, which was analyzed using PLS-SEM. The results obtained from the study shows a negative and insignificant relationship between ITG structure, process and relational mechanism to the performance.

Theoretical Review

Resource Based View Theory (RBVT)

This study review and underpinned Resource Based View theory, which explains how organizations can achieve competitive advantage by possession of certain resources or capabilities (Barney, 1991). Resources can be procured from the market whereas capabilities (such as learning culture or management skills) need to be developed within the firm through the process of building capabilities is more complex than acquiring resources in general (Qahatan et al., 2020). Thus, entity's performance is determined by their strategically relevant physical, human, and organizational capital, and by their unique capability of exploiting such resources (Diaz et al., 2021). As to IT resources, it is asserted that the equipment hardly qualify as sources of sustained competitive advantages as are not inimitable unless they are governed and managed in an excellent way to align with the entity's objectives (Qahatan et al., 2020). In support Dias et al. (2021) argued that an IT system that is deeply embedded in a firm's decision-making process might be a potential source of sustained competitive advantage.

In this perspective, IT may be considered a valuable strategic resource and an indispensable tool that helps organizations meet internal and external demands, promoting the optimal use of their resources to facilitate the achievement of institutional objectives with quality, safety, and efficiency (Qahatan et al., 2020). Though the RBV provides support for explaining the relevance of human capital, structural capital, relational capital, and spiritual capital as resources required by entities to enjoy a competitive advantage, this theory is not applicable to the public sector, due to the peculiar characteristics of the sector. This peculiarities include political and bureaucratic nature, non-profit-seeking, noncompetitive nature and diversity in the public sector stakeholders. Nonetheless, the entities can partially compete among themselves to outperform one another in delivering better service to the public and rendering return to the government. Therefore, the theory supports the association between IT governance and financial performance of public entities in terms of revenue generation to the government and better resource utilization.

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METHODOLOGY

Design

The research design employed by this study is cross-sectional survey research design. It is a survey because it entails going to the field for data collection, while it is cross-sectional because it involves one time data collection. The population of this study is 2316 staff of the five selected public entities in Bauchi state, which include Bauchi state ministry of finance, ministry of budget and planning, state board of internal revenue, office of the accountant general and the state office of the auditor general. These entities were selected because they are the major administrators of the state finances and so could provide valid information regarding affairs of the state finances. The sample size of the study was obtained using Krejcie and Morgan table of sample determination to arrive at 331 sample respondent, which were selected using stratified sampling technique. Thus, the data was collected using structured questionnaire, which was analyzed using multiple regression analysis with the help of SPSS version 23.

Model Specification

$PFP = \beta_0 + \beta_1 ITGS_i + \beta_2 ITGP_i + \beta_3 ITGR_i + e$
Where: PFP = Public Sector Financial Performance, ITGS = ITG Structure, ITGP = ITG Process, ITGR = ITG Relational Mechanisms and e = error term.

RESULT AND DISCUSSION

Presentation of Results

A total number of 331 copies of questionnaires were distributed to the sampled respondents in the selected ministries in Bauchi state. However, up to 242 questionnaires representing 73.1% were retrieved out of which 8 and 13 questionnaire of them representing 2.4% and 3.9% were rejected due to incomplete information of the respondents and outliers respectively. This makes valid and useful questionnaires to be 231 representing 66.8%. The rate is considered appropriate 30% of the total response is considered adequate for survey analysis (Sekeran & Bougie, 2013).

Coefficient of Determination

The Coefficient of Determination presented in Table 1 of this study expressed that the regression equation is significant with the following result: R= 0.199, R^2= 0.531, Adj. R^2= 0.506. This therefore infers that the exogenous variables (ITG structures, ITG process and ITG relations) accounts for 53.1% variance in public sector financial performance. Accordingly, Cohen (1992) classified R^2 into 3 orders as follows: 0.02 as weak, 0.13 as moderate and 0.26 as substantial. Going by this classification, the value of R^2 in the regression result of this study is substantial.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.199[a]	.531	.506	.437164

a. Predictors: (Constant), ITGS,ITGP,ITGR

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Regression Analysis and Hypothesis Testing

Regression analysis is a statistical technique that measures the degree or extent of the relationship between the variables of the study (Sekaran & Bougie, 2013). For the purpose of this study, multiple regression analysis was employed to test the research hypotheses that explain the extent of relationships that exist between the independent variable (ITG structures, ITG process and ITG relational mechanisms) and the dependent variable (public sector financial performance). Consequently, regression analysis as presented in Table 2 was conducted and the outcome of the analysis was used for answering the research questions of this study.

Table 2: Regression Result of the ITG Mechanisms and public sector financial performance

Model	**Unstandardized Coefficients**		**Standardized Coefficient**	**t**	**Sig.**	**Collinearity Statistics**	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	16.298	.084		6.179	.000		
ITGS	2.098	.065	.369	4.217	.000	.781	1.436
ITGP	1.071	.046	.194	2.381	.006	.254	1.167
ITGR	.359	.058	.099	0.913	.331	.594	2.308

a. Dependent Variable: PFP

In view of the regression result obtained, it implies that the public entities' financial performance in Bauchi state is greatly determined by IT governance structures and processes, while the contribution of relational mechanism is relatively weak. The following sections present the discussion of findings based on the obtained result.

DISCUSSION OF FINDINGS

Discussion of findings is the section where the researcher outlines the implication of the result as well as the justification of the findings with previous studies. Regarding the first objective, evidence from the regression result revealed that, there is significant positive relationship between IT governance structures and the financial performance of public entities in Bauchi state evident from the coefficient and p-value of 2.098 and 0.000 respectively. This implies that the first null hypothesis, which stated the "there is no significant relationship between IT governance structures and financial performance" is rejected and therefore the alternate hypothesis is accepted. Accordingly, this result is in line with the finding of Menshawy et al. (2022), which investigate the impact of IT governance mechanisms on firm performance of Iraqi enterprises. It also corroborates with Castellanos (2021) who examines the impact of ITG mechanisms on business-IT alignment and better performance in Columbia. These studies observed a significant relationship between IT governance structures and performance.

Secondly, the regression result also revealed a significant positive relationship between IT governance process and the financial performance of public sector entities in Bauchi state based on the coefficient value of 1.071 and p-value of 0.006. Based on that, the second null hypothesis, which postulated the lack significant relationship between IT governance processes and financial performance is rejected and the alternate hypothesis is accepted. Therefore, this finding can be justified by the result of Levstek et al. (2022), which investigate the impact of the key IT governance mechanisms on SMEs' performance and found significant positive relation. Also, the result align with Qahatan et al. (2020), which examine the effect of ITG mechanisms on firm performance with a mediation of organizational capabilities.

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Finally, the result of the third objective found an insignificant positive association between IT governance relational mechanism and the financial performance of public entities in Bauchi state looking at the coefficient of 0.359 and p-value of 0.331. Based on that, the third null hypothesis, which stated the "there is no significant relationship between IT governance relational mechanisms and financial performance" cannot be rejected and the alternate hypothesis is therefore rejected. In view of that, the result corroborate with the outcome of Vejseli et al. (2020), which investigate the implications of agile and traditional ITG mechanisms on firm performance with a mediation of IT alignment and found an insignificant effect of IT governance relational mechanisms on firm performance. The result disagrees with many prior studies, which may be due to the incomplete implementation of IT facilities in public institutions in the state.

CONCLUSIONS

The study found that IT governance process and IT governance structures have significant positive effect on public sector financial performance, while IT governance relational mechanisms was insignificantly related. Based on these findings, the study concludes that IT governance and its mechanisms serve as an effective tool for managing the state financial resources address the problem of inefficient service delivery inherent to public sector operations in Bauchi state.

Regarding the first objective, the paper concludes that the Bauchi state's structure of IT governance helps in ensuring that IT investment strategies align with the overall strategies of public sector organizations to ensure that the investment contributes directly towards achieving organizational financial objectives and enhance the overall effectiveness of public service delivery.

Secondly, based on the result of the second objective, this study concludes that there is up to date process legacy IT system within the public institutions in Bauchi state, which is enhanced by the effectiveness of IT governance and improve its contributions to the success public entities in the state.

Finally, this paper acknowledges the communication breakdown between IT with other departments among Bauchi state public institutions, which hinders the collaborative efforts necessary for effective IT governance implementation. This ineffective communication resulted in lack of understanding or support between the stakeholders in IT success that improves financial success.

RECOMMENDATIONS

In view of the conclusions presented in this study, the following recommendations were made thus:

i. Regarding the first objective, considering that IT governance structures improves the public sector financial performance, this study recommends public sector organizations in Bauchi state to implement a robust system of monitoring and evaluation of IT governance structures by regularly assessing the key performance indicators related to cost reduction, revenue enhancement and operational efficiency.
ii. Secondly, as the study concludes that IT governance process positively affects financial performance of public institutions in Bauchi state, this study recommends that the public

entities in the state should conduct a comprehensive review of the existing IT governance framework, including policies and processes to identity gaps and inefficiencies as well as the areas for improvement. This is to ensure that the deigned IT governance mechanisms are properly implemented and integrated with the overall organizational goals. Government from their part should contribute by enacting, implementing and enforcing enabling law that guides how IT resources of public entities should be governed in such a way that revenue accrued to the government is improved.

iii. Thirdly, the subsequent conclusion stated that IT governance relational mechanisms do not affect public sector financial performance. In view of that, this study recommends public entities in Bauchi state to ensure that mechanisms of IT governance relations are closely aligned with the organization's strategic objectives and financial goals. This can be achieved by fostering the collaboration between IT and business units of the organization to identify opportunities for IT support and operational efficiency.

LIMITATIONS OF THE STUDY

This study was limited to Bauchi state public institutions only, which triggered the need for more comprehensive study to consider the northeastern states or the country at large. Furthermore, as the study examined the direct effect of IT governance on financial performance, future researchers are recommended to examine the moderating effect of innovativeness on the relationship between the variables.

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